

Attorney Docket No. 1331

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Josef Kevin Gogerty                      Date: Dec. 10, 2002  
Serial No.: 09/760,149                      Group Art Unit: 1638  
Filed: January 12, 2001                      Examiner: David T. Fox  
For: "INBRED MAIZE LINE PH726"

Assistant Commissioner for Patents  
Washington, D.C. 20231

RULE 132 DECLARATION  
OF  
DR. STEPHEN SMITH

Sir:

I, Stephen Smith, PhD., do hereby declare and say as follows:

1. I am skilled in the art of the field of the invention. I have a Ph.D. in Biochemical Systematics and Taxonomy of Maize and its Wild Relatives from Birmingham University. I have a M.Sc. in the Conservation and Utilization of Plant Genetic Resources from Birmingham University. I have a Bachelor of Science degree in Plant Sciences from London University. Since 1977 I have been engaged in the development, study and application of molecular markers to genetics, measuring genetic diversity and tracking pedigrees. I commenced this work at North Carolina State University as a post-doctoral research fellow. I have continued my engagement in these studies during my employment by Pioneer Hi-Bred from 1980 until the present. These studies have resulted in numerous scientific articles that have appeared in peer reviewed scientific literature.
2. I have read and understood the Office Action in the above case dated October 30, 2002. This declaration is in response to the Examiner's rejection under, 35 U.S.C. § 102(e) as anticipated by or, in the alternative, under 35 U.S.C. § 103(a) as obvious over Morgan (U.S. Patent No. 5,824,848).
3. I have conducted an analysis of SSR marker data for inbred PH726 and the inbred cited as prior art, F361. Out of a total of 77 SSR loci examined, which allowed a sampling of each chromosome, there are 37 markers that show differences between

Appendix G

09/760,149

PH726 and F361. This represents a difference for 49% for the markers tested. Of these 37 markers, 18 were greater than 50 cM in distance, or unlinked on the genetic map.

4. Upon crossing PH726 to any other maize line and selfing successive filial generations, one would within the realm of what is statistically possible, obtain a progeny inbred maize line that retains genetic contribution from PH726. Assuming that (i) the cited prior art is used as the maize line to which PH726 is crossed, (ii) that the only difference between PH726 and F361 are these 37 markers, and (iii) that all markers within a 50 cM distance will segregate together, then the odds of obtaining a PH726 progeny inbred that is the same as F361 after one cycle of breeding, is 1 in  $2^{18}$  or 1 in 262,144. Statistically it is extremely unlikely that a PH726 progeny, after one cycle of breeding, would be the same as F361.

5. Further, the assumptions made above vastly overstate the likelihood of breeding PH726 from F361. For example, it is common practice in quantitative genetics to determine the relation of plants by differences in markers. In doing so, one extrapolates that a percentage difference in markers is indicative of a difference in the whole genome. To assume that the only differences between PH726 and F361 are for these 37 markers, when 37 markers constitute 49% of the 77 SSR loci examined, is a gross and unrealistic assumption. Further the current maize genetic map only has approximately sixty 50cM units, so by applying this limitation the maximum number of independently segregating loci one could obtain, using the most different maize lines that could ever be found, is sixty. These assumptions result in an over estimate of the odds of breeding PH726 from F361.

6. Given the difference in molecular markers between PH726 and F361, it is my expert opinion that PH726 and F361 are very distinct inventions. It is also my expert opinion that, within the realm of what is statistically possible, any progeny of PH726 developed through crossing PH726 with another plant will be distinct from F361. Given the facts and based on my education and scientific experience, I believe that the invention as claimed is not obvious nor anticipated by Morgan (U.S. Patent No. 5,824,848).

7. I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

09/760,149

Date: Dec 11<sup>th</sup> 2002

By: Stephen Smith

Stephen Smith